Abstract

In this thesis, we study the sharing value problems and the uniqueness problems of meromorphic functions in the theory of value distribution. In fact, this thesis contains the following results: We generalize a unicity condition of three meromorphic functions given by Jank and Terglane in class $\mathcal{A}$ to the case of arbitrary q meromorphic functoins. An elementary proof of a conjecture of C. C. Yang is provided. We construct a class of meromorphic functions with exact two deficient values and their deficiencies are explicitly computed. We generalize the Nevanlinna's five-value theorem to the cases that two meromorphic functions partially share either five or more values, or five or more small functions. In each case, we formulate a way to measure how far these two meromorphic functions are from sharing either values or small functions, and use this measurement to prove a uniqueness theorem. Also, we prove some uniqueness theorems on entire functions that share a pair of values $(a, -a)$ with their derivatives, which are reformulations of some important results about uniqueness of entire functions that share values with their derivatives. Finally, we prove that if two distinct non-constant meromorphic functions f and g share four distinct values a_1, a_2, a_3, a_4 DM such that each a_i-point is either a (p, q)-fold or (q, p)-fold point of f and g, then (p, q) is either $(1, 2)$ or $(1, 3)$ and f, g are in some particular forms.